

REMARKS

This responds to the Office Action dated on February 23, 2006.

Claims 1, 7, 12, 13-17, and withdrawn claims 20, 26, 27, 28, 32, 38, 39, and 40 are amended, no claims are canceled, and no claims are added; as a result, claims 1-45 are now pending in this application with claims 1-19 currently pending examination. The amendments to the claims are fully supported by the specification as originally filed. No new matter is introduced. Applicant respectfully requests reconsideration of the above-identified application in view of the amendments above and the remarks that follow.

Support for the amendments to claims 1, 7, 12 and withdrawn claims 20, 26, 32, and 38 may be found in the specification, for example, on page 21, lines 19-21. Claims 13-17, withdrawn claims 27 and 28, and withdrawn claims 39 and 40 are amended to bring the language in line with the language of claims 12, 26, and 38, respectively, from which they depend.

Objection to the Drawings

Figure 1 was objected to. Applicant traverses the grounds of objection to the drawings.

In the Office Action, it was stated that "Figure 1 should be designated by a legend such as -- Prior Art -- because only that which is old is illustrated." However, Figure 1 is used with sections of the detailed description of the specification that provides support for the claims of the instant application. The specification, for example, states in part in the paragraph beginning on page 23, line 23:

A transistor 100 as depicted in Figure 1 can be formed by forming a source/drain region 120 and another source/drain region 130 in a silicon based substrate 110 where the two source/drain regions 120, 130 are separated by a body region 132. The body region 132 separated by the source/drain 120 and the source/drain 130 defines a channel having a channel length 134. ... The LaAlO₃ film thickness is controlled by repeating for a number of cycles the pulsing of the lanthanum containing precursor, the first oxygen containing precursor, the aluminum containing precursor, and the second oxygen containing precursor until the desired thickness for film 140 containing LaAlO₃ is formed on the body region. A gate is formed over the gate dielectric 140.

Therefore, as demonstrated in the quoted section from the instant application, contrary to the abovementioned quote from the Office Action, Figure 1 does not illustrate only that which is old. Thus, Applicant submits that a legend such as -- Prior Art -- is not required.

Applicant respectfully requests withdrawal of these objections to the drawings.

In the Specification

The specification is amended to update the status of U.S. Application Serial No. 10/137,499, from which the instant application is a divisional application. The specification is amended to update the status of U.S. Applications, Serial No. 10/081,439 and Serial No. 09/797,324, which applications are included by reference in the instant application. No new matter is introduced.

The specification is amended with the paragraphs beginning on page 3, line 11 – page 5, line 11 being deleted. The specification is amended with paragraphs inserted beginning on page 6, line 19. The inserted paragraphs are from the specification as originally filed beginning on page 3, line 13 – page 5, line 4. No new matter is introduced.

Double Patenting Rejection

Claims 2 and 13 are alleged to conflict with claims 1 and 6 of Application No. 11/059,594. Applicant traverses these grounds of rejection of these claims.

Claims 1 and 6 of Application No. 11/059,594 recite “a dielectric layer containing LaAlO₃ ... dielectric layer including at least Al₂O₃ or La₂O₃.” Claims 2 and 13 of the instant application (including features from the independent claims from which they depend) recite “film containing atomic layer deposited LaAlO₃ ... the film includes Al₂O₃ and La₂O₃.” Applicant submits that features of claims 1 and 6 of Application No. 11/059,594 are generic to claims 2 and 13 of the instant application in that atomic layer deposited LaAlO₃ is a species of LaAlO₃. The language atomic layer deposited LaAlO₃ provides description of the structure of the claimed LaAlO₃. As noted in the specification on page 11, lines 23-28, an atomic layer deposited LaAlO₃ is formed by self-limiting growth which provides uniformity and conformality. A atomic layer deposited LaAlO₃ is structured as monolayers built up to a final thickness.

In addition, Applicant cannot find in Application No. 11/059,594 a discussion of atomic layer deposited LaAlO₃. Further, Application No. 11/059,594 has priority date that precedes the priority date of the instant application. Thus, Applicant submits that in accordance with MPEP §

822 referring back to MPEP §806.04(h) and MPEP §806.04(i), the double patenting rejection of claims 2 and 13 is not proper.

Applicant respectfully requests withdrawal of these rejections of claims 2 and 13, and reconsideration and allowance of these claims.

First §102 Rejection of the Claims

Claims 1, 2, 5, 6, 12, 13, 16, and 17 were rejected under 35 U.S.C. § 102(e) as being anticipated by Maeda (U.S. Patent No. 6,365,470). Applicant traverses these grounds of rejection of these claims.

Applicant cannot find in Maeda a disclosure, a teaching, or a suggestion of an electronic device including a film containing atomic layer deposited LaAlO₃ having a predetermined amount of lanthanum and aluminum on a surface on which the film contacts, as recited in claim 1. In the Office Action, it is stated that “it was assumed that the product was a film containing LaAlO₃.” Applicant respectfully disagrees. Claim 1 recites “atomic layer deposited LaAlO₃,” where an atomic layer deposited LaAlO₃ is a structure different from LaAlO₃ formed by other means. As noted in the specification on page 11, lines 23-28, an atomic layer deposited LaAlO₃ is formed by self-limiting growth which provides uniformity and conformality. A atomic layer deposited LaAlO₃ is structured as monolayers built up to a final thickness.

MPEP § 2113 states, in part,

The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979)

Applicant submits that the nature of the self-limiting growth in an ALD process and the structuring as build-up monolayers is analogous to such a structure as discussed in the above quote from MPEP § 2113. Therefore, the language “atomic layer deposited” is a feature in determining patentability of claim 1.

In addition, Applicant cannot find in Maeda a disclosure, a teaching, or a suggestion of a predetermined amount of lanthanum and aluminum on a surface as recited in claim 1. Therefore, Maeda does not teach each and every claim element of claim 1 and Maeda does not teach or

suggest the identical invention in as complete detail as is contained in claim 1. Thus, Applicant submits that claim 1 is patentable over Maeda.

For at least reasons similar to those stated with respect to claim 1, Applicant submits that claim 12 is patentable over Maeda. Claims 2, 5, and 6 and claims 13, 16, and 17 depend on claims 1 and 12, respectively, and are patentable over Maeda for at least the reasons stated herein.

Applicant respectfully requests withdrawal of these rejections of claims 1, 2, 5, 6, 12, 13, 16, and 17, and reconsideration and allowance of these claims.

Second §102 Rejection of the Claims

Claims 1, 3, 12, and 14 were rejected under 35 U.S.C. § 102(e) as being anticipated by Snyder et al. (U.S. Publication No. 2003/0032270). Applicant traverses these grounds of rejection of these claims.

Applicant reserves the right to swear behind Snyder et al. (hereafter Snyder) at a later date.

Applicant cannot find in Snyder a disclosure, a teaching, or a suggestion of an electronic device including a film containing atomic layer deposited LaAlO₃ having a predetermined amount of lanthanum and aluminum on a surface on which the film contacts, as recited in claim 1. Claim 1 recites “atomic layer deposited LaAlO₃,” where an atomic layer deposited LaAlO₃ is a structure different from LaAlO₃ formed by other means. As noted in the specification on page 11, lines 23-28, an atomic layer deposited LaAlO₃ is formed by self-limiting growth which provides uniformity and conformality. A atomic layer deposited LaAlO₃ is structured as monolayers built up to a final thickness.

MPEP § 2113 states, in part,

The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979)

Applicant submits that the nature of the self-limiting growth in an ALD process and the structuring as build-up monolayers is analogous to such a structure as discussed in the above

quote from MPEP § 2113. Therefore, the language “atomic layer deposited” is a feature in determining patentability of claim 1.

In addition, Applicant cannot find in Snyder a disclosure, a teaching, or a suggestion of a predetermined amount of lanthanum and aluminum on a surface as recited in claim 1. Therefore, Snyder does not teach each and every claim element of claim 1 and Snyder does not teach or suggest the identical invention in as complete detail as is contained in claim 1. Thus, Applicant submits that claim 1 is patentable over Snyder.

For at least reasons similar to those stated with respect to claim 1, Applicant submits that claim 12 is patentable over Snyder. Claim 3 and claim 14 depend on claims 1 and 12, respectively, and are patentable over Snyder for at least the reasons stated herein.

Applicant respectfully requests withdrawal of these rejections of claims 1, 3, 12, and 14, and reconsideration and allowance of these claims.

Third §102 Rejection of the Claims

Claims 1, 4, 7-12, 15, 18, and 19 were rejected under 35 U.S.C. § 102(e) as being anticipated by Halliyal et al. (U.S. Patent No. 6,642,573 B1). Applicant traverses these grounds of rejection of these claims.

Applicant reserves the right to swear behind Halliyal et al. (hereafter Halliyal) at a later date.

Applicant cannot find in Halliyal a disclosure, a teaching, or a suggestion of an electronic device including a film containing atomic layer deposited LaAlO₃ having a predetermined amount of lanthanum and aluminum on a surface on which the film contacts, as recited in claim 1. Claim 1 recites “atomic layer deposited LaAlO₃,” where an atomic layer deposited LaAlO₃ is a structure different from LaAlO₃ formed by other means. As noted in the specification on page 11, lines 23-28, an atomic layer deposited LaAlO₃ is formed by self-limiting growth which provides uniformity and conformality. A atomic layer deposited LaAlO₃ is structured as monolayers built up to a final thickness.

MPEP § 2113 states, in part,

The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which

the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979)

Applicant submits that the nature of the self-limiting growth in an ALD process and the structuring as build-up monolayers is analogous to such a structure as discussed in the above quote from MPEP § 2113. Therefore, the language “atomic layer deposited” is a feature in determining patentability of claim 1.

In addition, Applicant cannot find in Halliyal a disclosure, a teaching, or a suggestion of a predetermined amount of lanthanum and aluminum on a surface as recited in claim 1. Therefore, Halliyal does not teach each and every claim element of claim 1 and Halliyal does not teach or suggest the identical invention in as complete detail as is contained in claim 1. Thus, Applicant submits that claim 1 is patentable over Halliyal.

With respect to claims that include process features, Applicant notes that the method of forming an electronic device determines various properties of the device. Two devices formed in two different processes may have a number of common features. However, Applicant submits that if these two devices have different features they are not the same product, though they have common features. In electronics, features such as interface density and residual content from materials used to form a structure such as a LaAlO₃ film provide different structural and operating characteristics. Therefore, use of process features further limit the structure claimed. For instance, a HfO film generically includes a HfO film formed using HfCl₄ and a HfO film formed using HfI₄, where a HfO film formed using only HfI₄ as a hafnium-containing precursor further limits the film since residue from HfCl₄ would not be contained in the HfO film.

For at least reasons similar to those stated with respect to claim 1, Applicant submits that claim 12 is patentable over Snyder. Claim 4 and 7-11 and claims 15, 18, and 19 depend on claims 1 and 12, respectively, and are patentable over Halliyal for at least the reasons stated herein.

Applicant respectfully requests withdrawal of these rejections of claims 1, 4, 7-12, 15, 18, and 19, and reconsideration and allowance of these claims.

Assertion of Pertinence

Applicant has not responded to the assertion of pertinence stated for the patents cited, but not relied upon, by the Office Action since these patents are not relied upon as part of the rejections in this Office Action. Applicant is expressly not conceding they have any pertinence and reserves the right to respond more fully should any of them form a part of some future rejection.

Withdrawn Claims

In the Restriction Requirement mailed 29 September 2005, original claims 1-6 was acknowledged as generic to all original species. Withdrawn independent claims 20, 26, 32, and 38 are amended such that claims 1-6 remains generic to withdrawn claims 20-45. With the allowance of claim 1, Applicant respectfully requests the rejoinder and allowance of claims 20-45. *See M.P.E.P. 809 and 821.04.*

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 371-2157 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

KIE Y. AHN ET AL.

By their Representatives,

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 23 day of May, 2006.

LISA ROSORSKE

Name

Sisa Rosorske

Signature